



*engineering paths to transportation solutions*

August 27, 2003

Mr. James Flohr, P.E.  
Colorado Department of Transportation  
1480 Quail Lake Loop  
Colorado Springs, CO 80906

RE: Comments on Structure Selection Report  
Cimarron/Bijou Project (IM 0252-334, 13126)  
FHU Reference No. 01-266

Dear Mr. Flohr:

A meeting was held at the office of Felsburg, Holt & Ullevig (FHU) on July 29, 2003 to discuss the Structure Type Selection Report for the Cimarron/Bijou project. It was decided to issue an addendum to the report to address the major comments rather than reissue the report.

Meeting Attendees List:

John Deland	CDOT, Bridge
Sharon Wilson	CDOT, Bridge
James Flohr	CDOT, Region 2
Don Garcia	CDOT, Region 2
Don Hunt	CDOT
Matt Greer	FHWA
Cameron Glasgow	FHWA
Scott Waterman	Wilson & Company
Gary Turnquist	Wilson & Company
Ava Piel	Wilson & Company
David Weir	Wilson & Company
Wayne Dunkle	Wilson & Company
Bill Beams	Felsburg Holt & Ullevig
Elizabeth Stolfus	Felsburg Holt & Ullevig
Kass Alkanani	Felsburg Holt & Ullevig
Ed Lind	Felsburg Holt & Ullevig
Rick Dillon	Felsburg Holt & Ullevig

303.721.1440  
fax 303.721.0832  
e-mail [fhu@fhueng.com](mailto:fhu@fhueng.com)

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Greenwood Corporate Plaza  
7951 E. Maplewood Ave. Ste. 200  
Greenwood Village, CO 80111

August 27, 2003  
Mr. James Flohr, P.E.  
Page 2

FHU has compiled responses from our firm as well as Wilson and Company into one document to provide answers to your comments regarding the Structure Selection Report for the Cimarron/Bijou Project (IM 0252-334, 13126).

The attached "Comments on Structure Selection Report" lists your original comments and the responses to each one directly underneath the comment in bold italic font.

If you have further questions or comments after reviewing the comments, please let me know and I will address them or coordinate with Wilson and Company to clarify the item further.

Thank you.

Sincerely,

**FELSBURG HOLT & ULLEVIG**

Kass Alkanani, P.E.  
Senior Bridge Engineer

cc: John DeLand, P.E.

Attachments

KA/cg

# **Comments on Structure Selection Report Bijou Cimarron Project (IM 0252-334, 13126)**

Compiled from the following reviewers:

John DeLand  
Sharon Wilson  
Prabhatsinh Padhiar  
Mark Leonard (from meeting to discuss the SSR on 7-24-03)

I apologize for not furnishing comments while the report was still in the Draft stage. I give comments as if it were still the Draft stage in the case a revised Final SSR or an Addendum to the SSR is possible at this time.

The following are the proposed structures discussed in the SSR:

## **Main Line Bridges:**

I-17-OL (I-25 over Bear Creek)  
I-17-OM (I-25 over Cimarron St and Fountain Creek)  
I-17-OO (I-25 over Colorado Ave)

## **Creek Bridges:**

I-17-ON (NB on ramp at Cimarron)  
I-17-OR (SB off ramp at Cimarron)  
CSG-F.85-08.23E (Cimarron St over Fountain Creek)

## **Bijou Street Bridges:**

I-17-OQ (Bijou St over I-25)  
CSG G.15-08.84 (Bijou St over Monument Creek and UPRR)

## **I-25 Retaining Walls:**

Wall 1 (Str. Wall-I-17-CA) at edge of I-25 SB near Motor City  
Wall 2 (Str. Wall-I-17-CC) at edge of I-25 NB at south abutment Str. I-17-OL  
Wall 3 (Str. Wall-I-17-CD) at edge of I-25 NB at north abutment Str. I-17-OL  
Wall 4 (Str. Wall-I-17-CG) at edge of I-25 NB at south abutment Str. I-17-OM  
Wall 5 (Str. Wall-I-17-CI) at edge of I-25 SB at north abutment Str. I-17-OM  
Wall 6 (Str. Wall-I-17-BP) at edge of I-25 SB at north abutment Str. I-17-OO

## **Ramp Retaining Walls:**

Ramp C-1 Retaining Wall, (Str. Wall-I-17-CE) at SB I-25 On Ramp from Cimarron  
Ramp C-2 Upper Retaining Wall, (Str. Wall-I-17-CJ) at SB I-25 Off Ramp from Cimarron  
Ramp C-2 Lower Retaining Wall, (Str. Wall-I-17-CL) at SB I-25 Off Ramp from Cimarron  
Ramp B-3L Retaining Wall, (Str. Wall-I-17-CQ) at edge of NB I-25 north of Str. I-17-OQ  
Ramp B-4L Retaining Wall, (Str. Wall-I-17-CR) at edge of NB I-25 south of Str. I-17-OQ  
Cimarron Street Retaining Wall, (Str. Wall-I-17-BZ) at edge EB Cimarron St at east abutment of Str. CSG-F.85-08.23 (Cimarron St over Fountain Creek)

**Creek Retaining Walls:**

Ramp C-3 Retaining Wall, (Str. Wall-I-17-CM) at edge of NB I-25 at south abutment of Str. I-17-OO

Ramp B-4R Retaining Wall, (Str. Wall-I-17-BQ) at edge of NB I-25 Off Ramp from Bijou

Ramp B-3R Retaining Wall, (Str. Wall-I-17-CP) at edge of NB I-25 On Ramp from Bijou

**GENERAL COMMENTS:**

Use fewer pier columns. The I-25 Corridor Standards must be followed with respect to pier column shape and sizes, but Staff Bridge suggests the elimination of as many pier columns as possible to open up the area underneath the bridge as this is one of the best ways to improve bridge aesthetics. For example, at the Bijou over I-25 structure instead of 5 columns use 4 or even 3. If the Region concurs then this could be addressed in a Revised SSR or Addendum verbally by stating that "the number of pier columns shown in the drawings of the SSR show the maximum number of columns. Efforts to reduce as many pier columns as possible should be made in final design."

**Response:** *The columns shown on the general layouts for the bridge piers are intended to follow the I-25 Corridor Guidelines as closely as possible. In some locations it may be desirable to reduce the number of columns in a bent line. In final design the possibility of reducing the number of columns should be examined to meet aesthetic, phasing, and structural requirements.*

**SPECIFIC COMMENTS:**

**1.2 Description of Existing Structures:**

1. The Two Cell Concrete Box Culvert (existing Str. E-17-EI, I-25 over Bear Creek) is shown in the table on page 1 of the Introduction, but was not discussed this section. This section would be a good place to include a discussion as to why the proposed structure needs to be so much larger than the existing Two Cell CBC. This was discussed in previous meetings and I seem to remember it was due to the existing CBC being designed for a different hydraulic event than the proposed structure and also due the accommodation of an equestrian path underneath. Also discuss why the channel has dropped in elevation so much from the existing condition to the proposed.

**Response:** *The existing 2-cell 14' x 10' (span x rise) RCBC (Structure E-17-EI) is not adequate for passing the 100-year FEMA regulatory flow of 4,140 cfs. Construction of the Wal-Mart retaining wall along the north over bank constricts the flows and raises the water surface. Storm waters currently will pass to the east by a combination of the box culvert, spilling over existing Interstate 25 and spilling to the south into an adjacent basin. If the entire 4,140 cfs were to pass within the RCBC, over 15 feet of head would be needed. With a steep slope of 2.37 percent, the velocities in the box would approach 38 feet per second. This would cause severe erosion at the down side of the box. The CDOT Bridge Element Form lists stream bed problems*

***such as 2' of scour at the outlet. The form also states that the concrete apron was washed out and replaced with riprap and a check dam. This structure was built in 1959 and was probably sized by using a design storm with a flow less than the 100-year.***

2. The first paragraph says "There are eight existing structures in the project area that will be replaced." There are eight existing structures listed in the table under 1.2, but there are ten structures described under Sections 1.2.1 through 1.2.7. No mention is made in the SSR as to what is proposed for Str I-17-DJ and I-17-DK (which is really one structure due to a median closure done in the past). No mention is made, here, regarding the bridge over Monument Creek and the UPRR with respect to it's status relative to the upcoming project, although it is mentioned later on that it won't be done as part of this project. It would be good to clarify this from the start in this section.

***Response: The number of structures is a little confusing because a number of the structures have 2 structure numbers, but have had a median closure so there is really only one structure. Structures I-17-DF and I-17-DG are one structure. Structures I-17-DL and I-17-DM are one structure. Structures I-17-DJ and I-17-DK are one structure. Structures CSG-G.15-08.84E and CSG-G.15-08.84W have a closed median but remain separate enough that we are still considering them two structures. So we have 11 structure numbers, but only 8 bridges.***

***Add to table in section 1.2***

		Sufficiency	Inventory	Operating
I-25 over Midland Crossing I-17-DJ & I-17-DK	NO	78.9	29	48
Bijou over RR and Monument Creek (Not part of this Project)				
East Bound CSG-G.15-08.84E	NO	62.2	33	40
West Bound CSG-G.15-08.84	FO	74.8	36	40

### **1.2.7 Structure Numbers I-17-DJ and I-17-DK**

1. Discuss this section what is proposed for this structure as it is not documented in the SSR.

***Response: Bridges I-17-DJ and I-17-DK are I-25 over an abandon RR and are to be removed and filled in with earth.***

### **1.3.1 Construction Phasing (Phase 1B):**

1. Under "Traffic" is the statement "Bijou Street traffic is placed on the north half of the existing Bijou Street and bridges." It is not clear from this one statement or the Typical Sections in Appendix A how traffic is phased relative to the existing bridge. The other structures show traffic phasing in the Typical Sections as it relates to the existing bridge and this would be helpful this structure also.

**Response:** *The existing bridge on Bijou Street over the RR and Monument Creek is actually two bridges. Both directions of Traffic are to be placed on the North (West bound) Bridge while the South (East bound) Bridge is removed and replaced by phase 1 of the construction. Then both directions of traffic will be placed on the new phase 1 of construction while the North (West bound) Bridge is removed and replaced by phase 2 of the construction.*

### **1.6 Bridge Design Criteria**

1. Add statement: "Plans preparation shall following the CDOT Bridge Detailing Manual."

**Response:** *The bridge design detailing manual should be followed in all bridge detailing.*

## **3.0 Project Bridges**

### **3.1.2 I-25 Over Cimarron Street**

1. Under "Roadway Considerations" correct the typo in the last sentence from "northbound lanes and southbound lanes" to "eastbound lanes and westbound lanes".

**Response:** *The paragraph should be revised as follows: Cimarron Street: the horizontal alignment of Cimarron Street is on a tangent. Currently, Cimarron Street is two 12'-0" eastbound lanes and two 12'-0" westbound lanes separated by an approximately 5'-0" raised median. The new Cimarron Street will require a 2'-6" Curb and Gutter, three 12'-0" through traffic lanes westbound, one 12'-0" left turn lane into I-25 southbound, two 12'-0" through traffic lanes eastbound, two left turn lanes into I-25 northbound, and another 2'-6" Curb and Gutter. The eastbound and westbound lanes are separated by 10'-0" median at the bridge location for a total roadway width of 111'-0".*

2. How is expansion handled at the abutments? Fixity shown as F.

**Response:** *The details show Abutment 1 and Abutment 5 as F in error. They should be shown as an E for expansion.*

### **3.1.3 I-25 Over Colorado Avenue**

1. Under "Bridge Layout Requirements/Roadway Considerations" is the description of the City's bridge over Monument Creek which will ultimately carry rail transit. Also noted is the vertical clearance provided over Colorado Avenue of 16'-6" to the proposed structure and that no additional clearance will be provided for the City's rail transit facility. Is the 16'-6" clearance adequate for the rail transit facility? Mention what the anticipated necessary vertical clearance is for this facility.

**Response:** *The Rail Transit Facility required a vertical clearance of 16'-6" which is the same as the highway clearance. At the present time the idea of the rail transit facility has been dropped.*

2. The Alternative D square foot cost of \$51/sf and therefore total cost seem low for a bridge with these complexities and skew although it is mentioned that abutment backfill, slope paving, and approach slabs are not included in the cost. These costs that were not included should be so that the total bridge cost estimate is documented.

**Response:** *The cost for the items not included in the comparison level cost estimate is \$610,000. Adding this to the alternative costs gives a total cost estimate of:*

<b>Alter. A-3-span steel box</b>	<b>\$5,870,000</b>
<b>Alter. B-3-span precast U</b>	<b>\$4,970,000</b>
<b>Alter. C-3-span CIP box</b>	<b>\$4,420,000</b>
<b>Alter. D-4-span precast U</b>	<b>\$4,000,000</b>

**Cost from report for recommended alternative is:**  
**Modified Alter. D-3-span precast U \$4,050,000**

3. The recommended 3 span alternative has shifted the south abutment to the north of its initially considered location to decrease the amount of excavation at the south end of the bridge.

Question: Is the reason a one span structure is not possible at Colorado Avenue, with abutments located at the Pier 2 and Pier 3 locations of the three span alternative, because this would require the abutment exposure to be ~16'-6" which would violate the I-25 Corridor architectural standards which require semi-tall abutments with maximum exposure of 8'-6"? Or is it due to other facilities necessary at Colorado Ave. Please document this with a statement explaining this.

**Response:** *Under the section "Bridge Length (Abutment Location)" the cost of building a longer bridge as apposed to building tall abutments, retaining walls, roadway, roadway cantilever slab, and backfilling/excavating for the roadway is shown. Two additional items should be noted.*

*One, the fill for the existing roadway is present outside the limits of the existing bridge abutments. The presence of this fill means the amount of fill behind the abutments is less than where the fill is not*

*present. Also, the height of the retaining walls on the west side of I-25 is less if the fill is present because the retaining wall can sit on the fill at a higher elevation. The costs will be influenced by these two factors in such a way that the abutments and retaining walls will be less expensive where the fill is present. The fill is not present through the length of the existing bridge. So the costs tend to favor a new bridge that matches the length of the existing bridge.*

*Two, the length of the required overhang (cantilever) slab on the roadway increases as the roadway approaches the centerline of Colorado Avenue. Thus, the cost of the roadway cantilever slab favors a longer bridge.*

*Another item mentioned in the section noted above is the high cost of a bridge pier. This indicates that the costs favor a bridge with fewer spans.*

*As noted in the section, balancing all of these factors to achieve the most cost effective bridge length and location is not easy and the costs tend to be neutral in the range that approximates the length of the existing bridge. The recommended alternative is slightly shorter than the existing bridge. A one or two span bridge is too short because the costs of the roadway cantilever slab become too great. A five or six span bridge is too long and the cost of excavation, bridge and piers exceeds the savings of the other items. Three or four span structures seem to balance the costs the best and as noted in the report, the three span seems to have a slight cost advantage over the four span. Adjustments of the span lengths a few feet are basically cost-neutral at this location. The abutment and pier locations were selected to best meet the existing facilities at the site. In final design, some adjustment of the span lengths could be tolerated if required by detail requirements.*

4. Under "Girder Haunches and Bearings" the last sentence of the last paragraph reads "It is noted that because of the skew, and the difference in elevation between the two ends of a single girder, tapered bearing pads will be required." Tapered bearing pads are not allowed by AASHTO. Two distinctly different uniform thickness leveling pads would be more appropriate.

**Response:** *The reference in the "Girder Haunches and Bearings" that mentions tapered bearing pads was intended to read tapered sole plates at the bearing devices.*

5. Show cantilevered roadway slab in Plan and Longitudinal Section and also the approach slab. Show the fixity at abutments - F?

**Response:** *This has been done in the drawings, but will not be included in this submittal due to time constraints.*



### **3.2.2 Cimarron Street over Fountain Creek**

1. Under "Structure Options" please include an explanation as to why a box girder alternative was not considered for the Cimarron St over Fountain Creek bridges as it was for the NB On Ramp and SB Off Ramp.

**Response:** *During the corridor progress meeting, it was decided that the On and Off Ramp bridges and Cimarron over Fountain Creek bridge should all exhibit the same structure features. During the preliminary analysis for the On and Off Ramp bridges, it was discovered that the box girder will cost more than the Bulb Tee girder. Since we recommended the use of Bulb Tee girder for the use of the On and Off Ramp bridges, the box girder was not considered for Cimarron Street over Fountain Creek.*

### **3.3.1 Bijou over I-25**

1. On the Nevada-Tejon project a precast tub girder alternative VE proposal, in lieu of the Contract Plan CIP post-tensioned box girder bridge design, was submitted by the Contractor and accepted for construction by the Region. Mark Leonard requests that the Contract Plans for this project include a 40% (FIR level General Layout and design criteria) design for the precast tub girder as a design-build option.

**Response:** *For this structure the cost of dewatering and drainage of the depression is twice the cost of the bridge. Every effort needs to be made to keep the structure depth as short as possible to prevent making the depression any deeper than it already is. Precast tub girders require a deeper depth of superstructure than a cast in place concrete structure and any slight savings in structure cost will be more than offset by the increase in the cost of drainage structures. We will not be adding a General Layout for tub girders to this submittal.*

2. It is suggested that the bottom flange be taken out at every other cell of the CIP option. Leaving out the bottom flange at every other cell will help the aesthetics of the CIP bridge.

**Response:** *This has been done with the drawings, but will not be included in this submittal due to time constraints.*

3. In the final condition, at some future time when the structure over the UPRR and Monument Creek is built, the grade of the bridge over I-25 will need to be raised to meet the grade of the proposed structure over the UPRR and Monument Creek. There is a concern that water will seep through the asphalt placed over the soil fill used for this grade raise, saturate the soil, and be dammed at the west downhill end of the bridge causing problems at this end of the structure. Consideration should be given in the final design of the structure over I-25 to accommodate the grade raise with a voided slab addition connected to the original structure and be self-supporting.

**Response:** *This has been done with the drawings, but will not be included in this submittal due to time constraints.*

4. Consider leaving the east approach slab off of the Bijou over I-25 bridge until the UPRR/Monument Creek bridge is built and use asphalt pavement in the area between bridges until the UPRR/Monument Creek bridge is built.

**Response:** *Because it is unknown how long it will be before the Bijou Street Bridge over the RR and Monument Creek will be constructed, we are considering the interim situation to be permanent and will include the approach slab until more information is available.*

### **3.3.2 Bijou Street over UPRR**

1. Bridge Design Memo 2.4 Railroad Clearances (dated June 1, 2001) is a revision to the March 20, 1989 Bridge Design Memo. "This revision allows the March 20, 1989 clearance requirements to lapse, and it synthesizes the clearance recommendations in the references that are cited in the next paragraph. It illustrates reasonable clearances for highway bridges over railroads." The memo lists maximum and minimum clearance requirements of the various agencies. For example, the FHWA minimum clearance to an obstruction such as a crashwall on a pier is 9'. Alternative 1 is the 5 span alternative that spans the existing tracks with accommodations made for UPRR clearance requirements (18'). The railroad span includes 25' from the eastmost existing track to Pier 5 and 18' from Pier 4 to the westmost existing track. Although the total bridge length may need to stay the same (due to the abutments being positioned where they need to be for other reasons) the span over the railroad for this alternative could be 25' shorter if all that is accommodated is the FHWA minimum. Structural costs for this railroad span might be less than the span necessary to accommodate the UPRR requirements. It might be possible to get the railroad to pay for these extra structural costs through a PUC-lead negotiation. If, however, it is the Region's intent to use a span that eliminates crashwalls, the span length is determined based on CDOT's aesthetic requirements. In this case the extra span length structural costs would not be the railroads responsibility.

**Response:** *The situation at this bridge is very complex and it is difficult to say who will pay for what items. Union Pacific Railroad is insisting on a minimum of 18 feet of clearance to their tracks and it appears they will get it. A PUC-lead negotiation will by no means be a sure thing especially since the height, width and length of the bridge are not changing from one alternative to the next. The best we can do for this submittal is consider the overall coat of the structure for a bridge with 18 feet of clearance and leave the negotiation of the split between State, City, Park and Railroad funding for later negotiations.*

In any event either the main railroad span needs to be increased so that the clearance to the west pier is 25', or a crashwall needs to be used at this pier, or "heavy racetrack-type" columns need to be used at this pier, or a "hammerhead-type pier needs to be used at this pier. Increasing the railroad span by another 7' on the west end may make Alternative 1 unworkable.

**Response:** *Making the piers crash-worthy is the simplest approach at this point. In the general comments the use of fewer columns is discussed and the use of columns large enough to meet AREMA requirements will need to be addressed in final design as well.*

2. Under "Alternative 2: Steel girders spanning above the deck", in the third paragraph, it is mentioned that the future track would still have the "same relationship to the property lines that existed in Alternative 1. Wouldn't the track need to be shifted to the west to maintain the Alternative 1 18' distance to track?

**Response:** *The pier 4 location can change by shifting the 25 feet clearance and the 18 feet clearance from one side of the pier to the other without changing the location of the future track. Making this change has no impact on cost and will not make a difference in the recommended structure type.*

3. For the steel girders spanning above the deck how are the girders laterally supported?

**Response:** *Having stiff elements anchored to the deck that reach vertically up to the top flange and support it can laterally support the girders.*

4. Would the median girder need more protection from traffic than just the median curb? and vice versa?

**Response:** *The median girder could be hidden in the median because the profile grade line is more than a foot higher than the outside edge of the bridge which can be added to the 6 inch high curb and thus allow a total of an additional foot and one half for the depth of the median girder. Any errant vehicle will simply pass over the top of the girder.*

## **5.0 Project Retaining Walls**

1. What is the reason the Wall B-3R (Str. Wall-I-17-CP) is the only wall on spread footings.

**Response:** *Wall B-3R is the shortest retaining wall on the project. Tall walls under similar conditions are MSE walls. Shorter walls (walls less than about 8 feet tall) are more economical as concrete cantilever walls on spread footings.*

## **Appendix A**

1. In "Figure 1" (General Layout of Str I-17-OL) show 10'-0" proposed bikepath in Plan. Show vertical clearance to bike path in the Longitudinal Section.

**Response:** *The proposed bikepath is 10'-0" wide and the minimum vertical clearance from the girder soffit to the top of bikepath is 12'-0".*

2. Show Profile Grade "Figure 2" (Typical Section Str I-17-OL).

**Response:** *The bridge location of I-25 over Bear Creek will be on a vertical tangent. The profile grade is shown in Figure 1 in the Longitudinal Section.*

3. Show vertical clearance to bikepath and to Cimarron St "Figure 4" (General Layout Str I-17-OM).

**Response:** *The minimum vertical clearance for the girder soffit to the top of bikepath is 27'-3".*

4. Show all required dimensions and locations of lanes median and rail transit facility for the existing and future template of Colorado Ave. "Figures 8, 9, and 10" (General Layouts Str. I-17-OO).

**Response:** *At present there is no rail transit facility proposed for the future and the City has no plans to change the existing lane and median configuration, so the dimensions of lanes shown are the future lane configuration.*

5. Show moment slab in Plan "Figures 8, 9, 10" and limits of fascia girder (dashed or hidden line) in Plan. Show approach slabs in Plan.

**Response:** *This has been done with the drawings, but will not be included in this submittal due to time constraints.*

6. Show E or F symbol in Longitudinal Section "Figures 8, 9, 10".

**Response:** *All the piers and abutments will be fixed, F.*

7. Show vertical clearance to bikepath "Figure 15" (General Layout Str I-17-OR)

**Response:** *The minimum vertical clearance for the girder soffit to the top of bikepath is 10'-0".*

8. Show vertical clearance to bikepath "Figure 17" (General Layout Str K-17-ON)

**Response:** *The minimum vertical clearance for the girder soffit to the top of bikepath is 10'-0".*

9. Show min. vertical clearance to existing I-25 "Figure 23" (General Layout Str I-17-OQ)

**Response:** *The minimum vertical clearance from the existing roadway to the new structure is 20'-7".*

10. "Figure 24" shows abutment monuments. According to Staff Bridge policy these monuments need to be separated structurally from the abutments and supported on their own foundations.

**Response:** *Monuments shall be separated from the bridge structurally.*

11. The sidewalk and curb shown in the Typical Section Future in "Figure 25" (Typical Section Str I-17-OQ) is shown floating on top of the future fill on top of the bridge. The vertical curb of the sidewalk needs to extend down to the top of the deck to be mounted to the deck. Callout fill in the Typical Section Future.

**Response:** *It is intended for the fill on the Bijou Bridge over I-25, to raise the roadway above the bridge deck, shall be solid concrete. This will allow the future curb to sit on structural concrete.*

12. In "Figure 28" (General Layout CSG-G.15-08.84A, Alternative 1) shows a 5 span structure. It looks like it was the intent of the design to balance the span over the railroad with the adjacent shorter spans. Would it be possible, without increasing the superstructure depth except as needed at the piers, to have combined Piers 2 and 3 into one pier so that the short middle span is eliminated and the bridge would become a 4 span? This 4 span would then have spans of approximately 110'/148'/148'/69'.

**Response:** *On the Bijou Bridge over the RR and Monument Creek the question is can span 3 be made as long as span 4. The roadway elevation at the span between piers 3 and 4 is lower than the span between piers 4 and 5, but the elevation of the RR is the same in both spans. Thus, the structure depth in span 3 is less than span 4. It is not practical to make span 3 into a span that is the same as span 4 because the structure depth would be inadequate.*

13. In "Figures 28, 29, 30, and 31 (General Layouts CSG-G.15-08.84A) show and callout west RR boundary.

**Response:** *The west RR boundary is the east Park Boundary which appears about the middle of the drawing.*

## **Appendix B**

1. Show moment slab in Plan for all General Layouts of MSE walls.

**Response:** *This has been done with the drawings, but will not be included in this submittal due to time constraints.*

**Appendix C**

1. Include the structure number in the title of each itemized cost.

***Response: This has been done with the spreadsheets, but will not be included in this submittal due to time constraints.***

**Project:** Cimmaron / Bijou Interchange  
**Location:** Bijou Street over the UPRR and Monument Creek  
**Alternative 7:** 5-Span Rolled Steel I-Girders  
**Estimate:** Preliminary Cost Estimate  
 Structure Number CSG-G.15-08.84A

Wilson & Company  
 By: DBW  
 Date: 8/25/03

ITEM	DESCRIPTION	UNIT	TOTALS	UNIT COST	COST
202	REMOVAL OF BRIDGE	LS	1	\$ 200,000.00	\$ 200,000
206	STRUCTURE EXCAVATION	CY	6,221	\$ 7.00	\$ 43,547
206	STRUCTURE BACKFILL (CLASS 1)	CY	8,208	\$ 16.00	\$ 131,328
206	STRUCTURE BACKFILL (CLASS 2)	CY	1,242	\$ 10.00	\$ 12,420
206	MECHANICAL REINFORCEMENT OF SOIL	CY	6,588	\$ 20.00	\$ 131,760
403	HBP	TON	1,161	\$ 55.00	\$ 63,855
503	DRILLED CAISSON (36 IN)	LF	780	\$ 140.00	\$ 109,200
504	PRECAST PANEL FACING	SF	2,624	\$ 120.00	\$ 314,880
509	STRUCTURAL STEEL	LB	2,521,093	\$ 0.80	\$ 2,016,874
514	PEDESTRIAN RAILING (STEEL)	LF	1,032	\$ 188.00	\$ 194,016
515	WATERPROOFING MEMBRANE	SY	7,374	\$ 8.00	\$ 58,992
518	BRIDGE EXPANSION DEVICE (0-4 IN)	LF	312	\$ 138.00	\$ 43,056
601	CONCRETE CLASS D (BRIDGE)	CY	3,930	\$ 325.00	\$ 1,277,250
601	STRUCTURAL CONCRETE COATING	SY	3,251	\$ 5.00	\$ 16,255
602	REINFORCING STEEL	LB	337,000	\$ 0.50	\$ 168,500
602	REINFORCING STEEL (EPOXY COATED)	LB	623,000	\$ 0.60	\$ 373,800
606	BRIDGE RAIL TYPE 10M (SPECIAL)	LF	1,032	\$ 92.00	\$ 94,944

<b>Subtotal</b>	<b>\$ 5,250,677</b>
<b>Misc. Items &amp; Contingency 15%</b>	<b>\$ 787,602</b>
<b>Total</b>	<b>\$ 6,038,279</b>
<b>Total Estimate of Probable Construction Cost</b>	<b>\$ 6,040,000</b>
<b>Structure Area (SF)</b>	<b>62,250</b>
<b>Cost / SF</b>	<b>\$97</b>

**Project:** Cimmaron / Bijou Interchange  
**Location:** Bijou Street over the UPRR and Monument Creek  
**Alternative 1:** 5-Span Steel Plate Girders  
**Estimate:** Preliminary Cost Estimate  
 Structure Number CSG-G.15-08.84A

Wilson & Company  
 By: DBW  
 Date: 8/25/03

ITEM	DESCRIPTION	UNIT	TOTALS	UNIT COST	COST
202	REMOVAL OF BRIDGE	LS	1	\$ 200,000.00	\$ 200,000
206	STRUCTURE EXCAVATION	CY	6,221	\$ 7.00	\$ 43,547
206	STRUCTURE BACKFILL (CLASS 1)	CY	8,208	\$ 16.00	\$ 131,328
206	STRUCTURE BACKFILL (CLASS 2)	CY	1,242	\$ 10.00	\$ 12,420
206	MECHANICAL REINFORCEMENT OF SOIL	CY	6,588	\$ 20.00	\$ 131,760
403	HBP	TON	1,161	\$ 55.00	\$ 63,855
503	DRILLED CAISSON (36 IN)	LF	780	\$ 140.00	\$ 109,200
504	PRECAST PANEL FACING	SF	2,624	\$ 120.00	\$ 314,880
509	STRUCTURAL STEEL	LB	2,524,093	\$ 1.10	\$ 2,776,502
514	PEDESTRIAN RAILING (STEEL)	LF	1,032	\$ 50.00	\$ 51,600
515	WATERPROOFING MEMBRANE	SY	7,374	\$ 8.00	\$ 58,992
518	BRIDGE EXPANSION DEVICE (0-4 IN)	LF	312	\$ 138.00	\$ 43,056
601	CONCRETE CLASS D (BRIDGE)	CY	3,920	\$ 325.00	\$ 1,274,000
601	STRUCTURAL CONCRETE COATING	SY	3,251	\$ 5.00	\$ 16,255
602	REINFORCING STEEL	LB	337,000	\$ 0.50	\$ 168,500
602	REINFORCING STEEL (EPOXY COATED)	LB	623,000	\$ 0.60	\$ 373,800
606	BRIDGE RAIL TYPE 10M (SPECIAL)	LF	1,032	\$ 92.00	\$ 94,944

<b>Subtotal</b>		<b>\$ 5,864,639</b>
<b>Misc. Items &amp; Contingency</b>	<b>15%</b>	<b>\$ 879,696</b>
<b>Total</b>		<b>\$ 6,744,335</b>
<b>Total Estimate of Probable Construction Cost</b>		<b>\$ 6,745,000</b>
<b>Structure Area (SF)</b>		<b>62,250</b>
<b>Cost / SF</b>		<b>\$108</b>